

### CLAIMS

1. A method for writing nanostructures with controlled size, periodicity and number on a thin film of bistable molecules by means of a localized external stimulus.

5        2. The method according to claim 1, wherein the information is written and read on a thin film of bistable molecules in the form of strings of nanostructures.

3. The method according to claim 1, wherein the periodicity and size of the nanostructures is controlled by the thickness of the film.

10       4. The method according to claims 1-3, wherein the number of nanostructures is controlled by the length of the string on which the perturbation acts.

5. The method according to claims 1-4 for fabricating arrays of nanostructures.

15       6. The method according to claims 1-4, wherein said method is used to write information with an areal density of 10-100 Gbps.

7. The method according to claim 1, wherein the external stimulus is of the mechanical, thermal, thermomechanical, electrical, or radiative type.

20       8. The method according to claims 1 and 2, wherein the external stimulus is performed with a tip of a scanning probe microscope, be it a scanning tunneling microscope, an atomic force microscope or a near-field optical microscope or another technique derived therefrom.

9. The method according to claims 1 and 2, wherein the external stimulus is performed with the multiple tips of a millipede.

25       10. The method according to claims 1 and 2, wherein the external stimulus is performed with an scanning electronic microscope or with a confocal optical microscope or other derived technologies.

30       11. The method according to claims 1 and 2, wherein the external stimulus is provided with a stamp of hard or soft material with pressure and/or temperature control.

12. The method according to claim 1, wherein information writing is based on molecular multistability amplified to a supramicrometer scale by means of a morphological reorganization.

13. The method according to claim 1, wherein the bistable molecules  
5 are taken from the group of rotaxanes and thin films thereof.

14. The method according to claim 1, wherein the bistable molecules are taken from the group of catenanes and thin films thereof.

15. The process according to claims 1, 14, 15, wherein the thin films  
10 are deposited or grown by generic techniques from a solution, or from a vapor phase or from precursors or by sublimation.